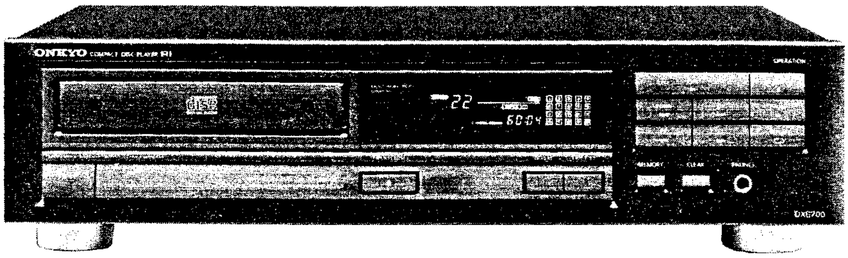
SERIAL NO. 3358

ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER
MODEL DX-6700



Black and silver model

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Signal readout system:	Optical non-contact
Reading rotation:	About 500~200 r.p.m. (constant linear velocity)
Linear velocity:	1.2~1.4m/s
Error correction system:	Cross interleave readsolomon code
Decoded bits:	18 bits linear
Sampling frequency:	352.8kHz (8 times oversampling)
Number of channels:	2 (Stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.004% (at 1kHz)
Dynamic range:	98dB
Signal to noise ratio:	100dB
Channel separation:	100dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	12 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	435×112×301mm 17-1/8"×4-7/16"×11-13/16"
Weight:	4.6kg. 11-13/16 lbs.

Specifications are subject to change without notice.

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NOTE ON COMPACT DISC

- **Holding Compact Discs**

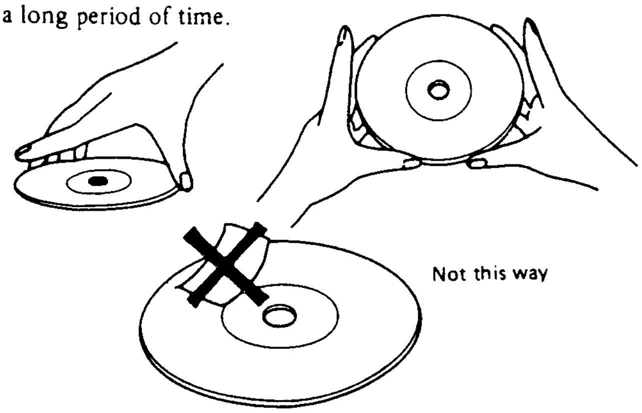
Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

Do not attach tape or paper to the label side of the disc and always be careful not to leave fingerprints on the side that is played.

- **Storing Compact Discs**

Store Compact Discs in a location protected from direct sunlight, high heat and humidity and extremely high and low temperatures. Discs should never be left in the trunk or interior of an automobile in the sun since the temperature can become very high in such a closed environment.

Always store Compact Discs in the holders in which they were sold. Never leave a disc in the player's disc holder for a long period of time.



- **Cleaning Compact Discs**

Before playing a disc wipe off the playing surface with a soft cloth to remove dust and other soil. Wipe the surface in straight lines from the center of the disc outward, not in a circular motion as you would with a phonograph record.

Do not use benzene, chemical cleansers or phonograph record cleaning solutions to clean Compact Discs. Also avoid static electricity prevention solutions since they can damage the surface of Compact Discs.

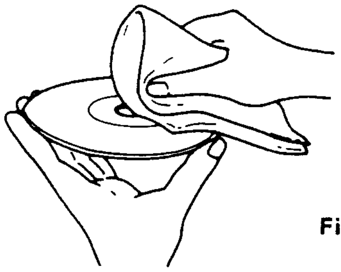


Fig. 9

Problems Caused by Dew

Dew can form inside a Compact player when it is brought from a cold environment into a warm room, when a room is rapidly heated and if a player is left in a humid environment.

This dew can prevent the laser pickup from reading the data contained in the pits in the disc surface. If the player does not operate properly because of dew, remove the disc and leave the player's power switch on for about one hour to remove all moisture.

CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc. that the components are liable to be broken down or its reliability remarkably deteriorated.

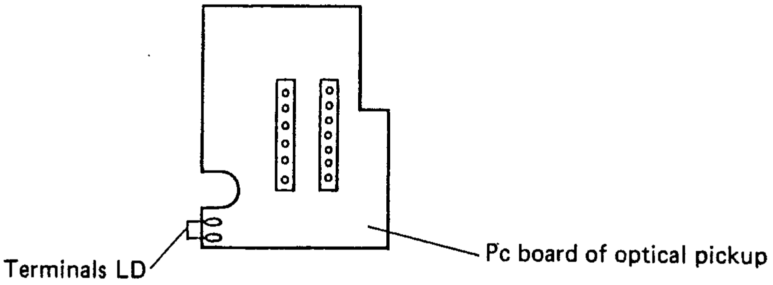
During repair, carefulley take the following precautions. (The following precautions are included in the service parts).

PRECAUTIONS

1. **Ground for the work-desk.**
   Place a conductive sheet such as a sheet of copper (with impedance lower than $10^6\Omega$) on the work-desk and place the set on the conductive sheet so that the chassis.
2. **Grounding for the test equipment and tools.**
   Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.
3. **Grounding for the human body.**
   Be sure to put on a wrist-strap for grounding whose other end is grounded.
   Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.
4. **Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.**
5. **Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.**

Care should be taken with the optical pickup.
The optical pickup is sensitive to static electricity, surge currents, and other high electrical noise, and because there is the possibility of damage to performance, in the handling of the pickup, the utmost care must be taken, particularly with regard to static electricity.

1. When checking the laser terminal, avoid making connections using the probes of a tester or oscilloscope, or an ordinary power supply.
2. When replacing the optical pickup, first short the LD terminals and remove the connector. Also, when attaching the new optical pickup, after attaching the connector, unsolder the LD terminals.



PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMMISION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

- Material: GaAS/GaAlAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

  *This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABEL

The label shown below are affixed.

1. **Warning lable**
   This label is located on the arm of mechanism.

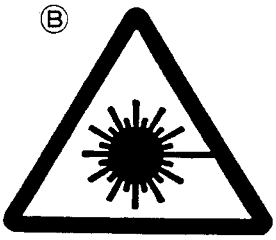
Ⓐ

DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L'ECLENCHEMENT DE SECURITE ANNULE.

Ⓑ



Ⓒ

ADVARSEL: USYNLIG LASERSTRÅLING
VED ÅBNING, NÅR SIKKERHEDSAF-
BRYDER ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

Ⓐ : Danger label
Ⓑ : Except 120V model
Ⓒ : Except 120V model

2. **Class 1 label**
   This label is located on the back panel.

"CLASS 1 LASER PRODUCT"

ADVARSEL

Denne mærkning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

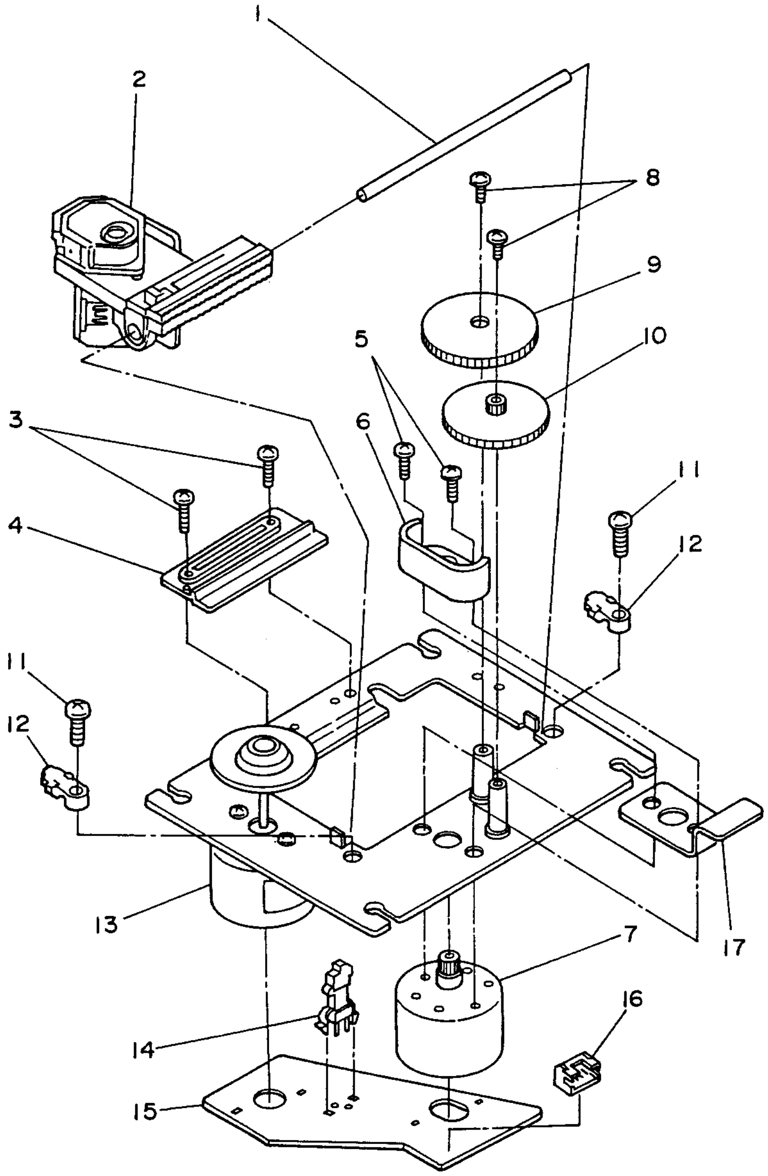
APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

VAROITUS! Laite sisältää laserdiodin, joka lähettää (näkymätöntä) silmille vaarallista lasersäteilyä.

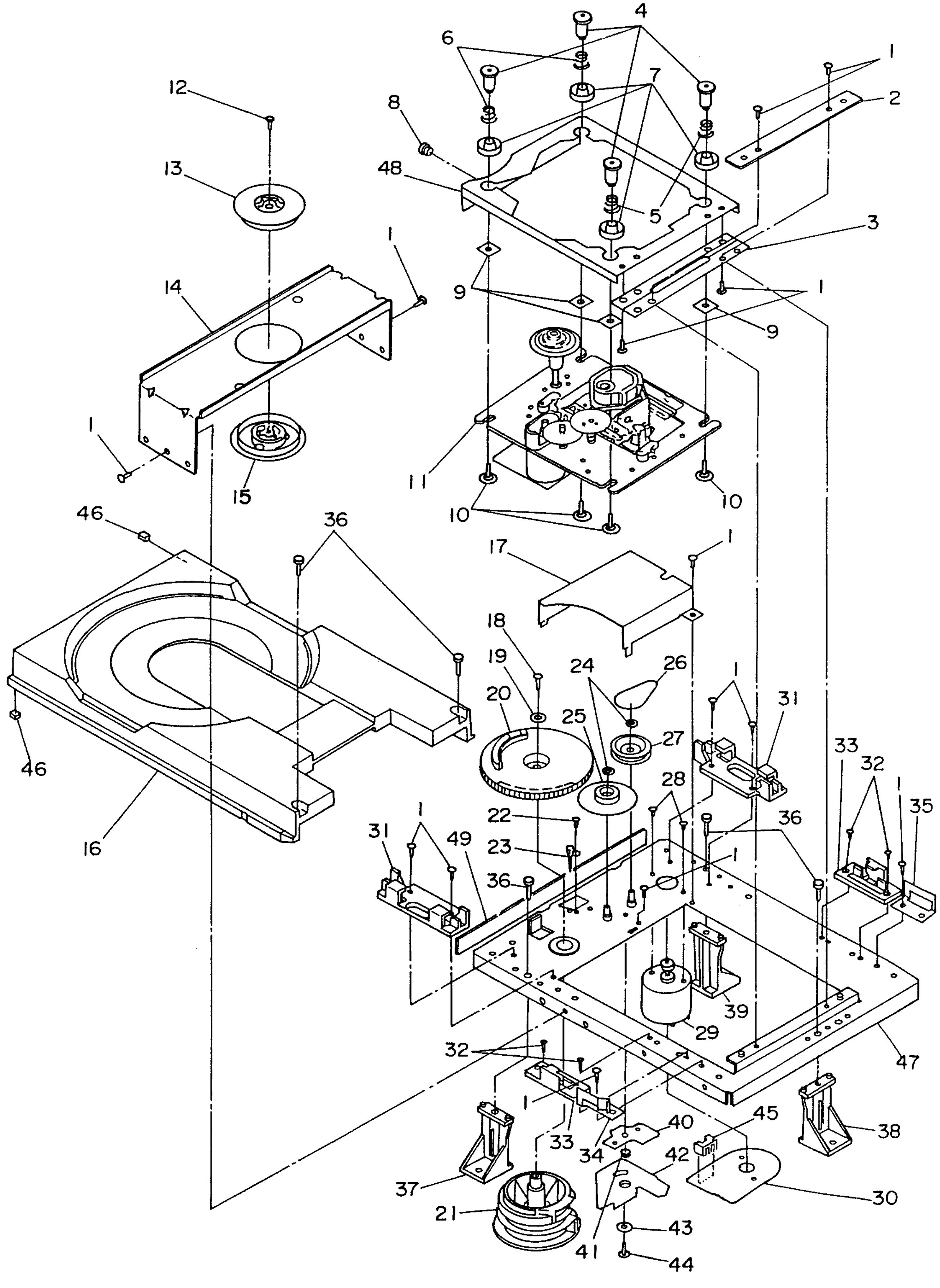
MECHANISM-EXPLODED VIEW

PICKUP UNIT-EXPLOVED VIEW



PARTS LIST

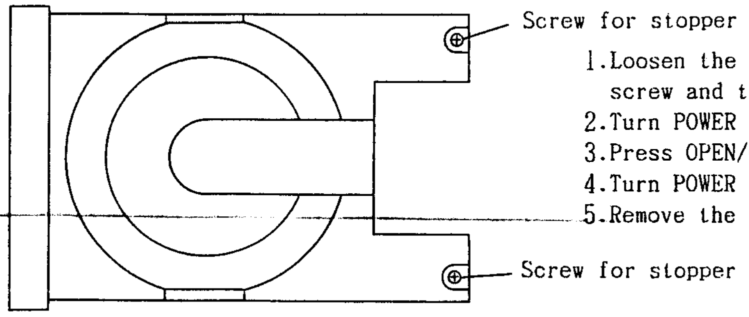
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	24506900	Shaft,slide	10	24506904	Wheel B
2	24110005	KSS-150A,Optical pickup	11	801427	+STP2.6×8,Special screw
3	801425	S2×5,Special screw	12	24506905	Clamp,shaft
4	24506901	Holder,slide	13	24502253	Spindle motor ass'y
5	82112005	+P2×5,Pan head screw	14	25065377	NLF-12018,Leafswitch
6	24506902	Cover,gear	15	24505270	Motor pc board
7	24502251	Motor	16	25050396	NSCT-4P223,Socket
8	801426	M1.7×3,Special screw	17	24506906	Stopper
9	24506903	Wheel A			



PARTS LIST

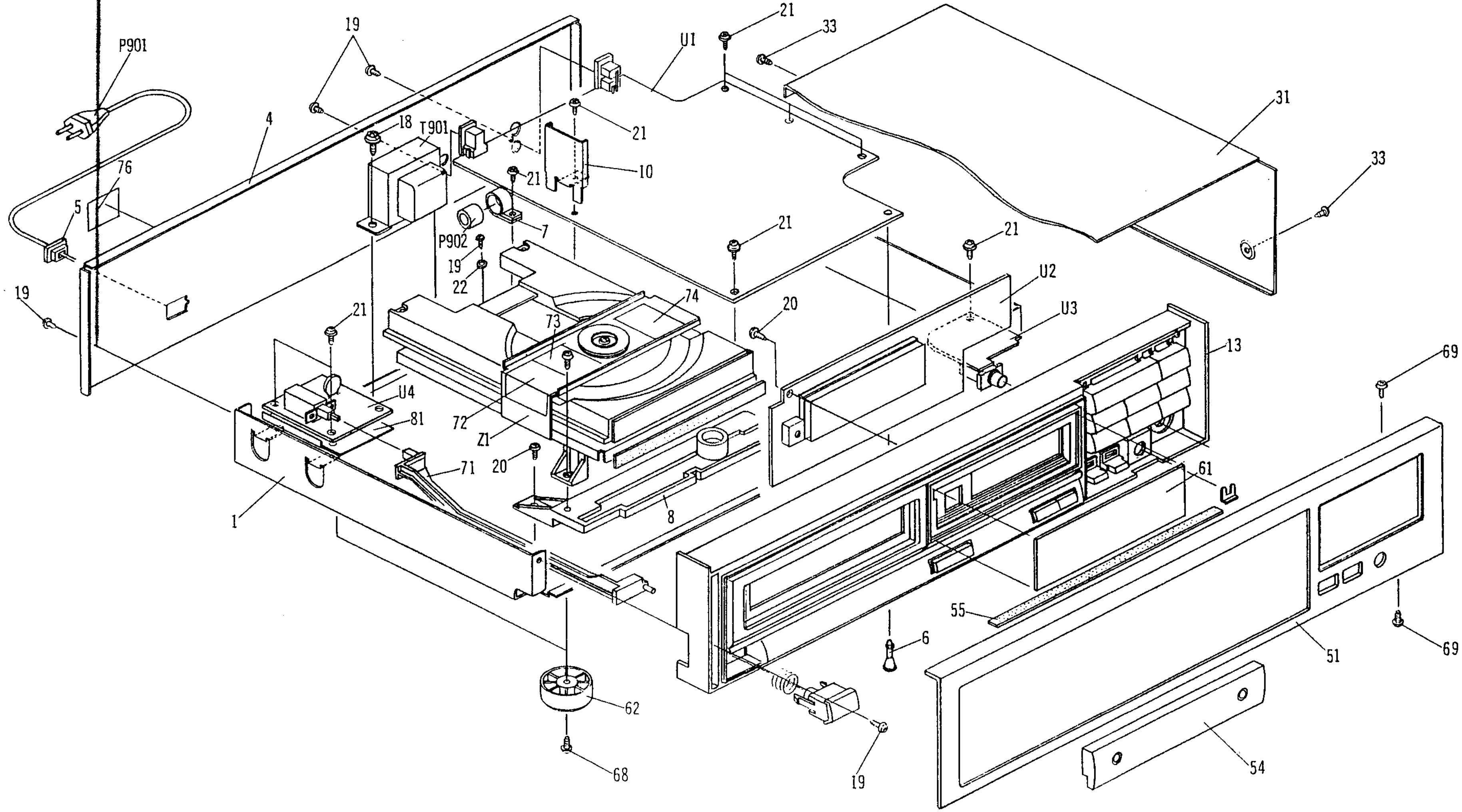
REF.NO.	PART NO.	DESCRIPTION
1	834126069	2.6TTS+6C,Self-tapping screw
2	24506864	Holder,hinge
3	24506865	Hinge
4	24506866	Shaft
5	27180441	Conical coil spring B
6	27180442	Conical coil spring A
7	24509401	Insulator C
8	24506870	Roller
9	24506871	Plate
10	801424	Screw with washer
11	24506873	KSM150ACM,Pickup unit
12	838426068	2.6TTB+6B(BC),Self-tapping screw
13	24506875	Magnet ass'y
14	24506876	Chassis,chucking
15	24506877	Pulley,chucking
16	24506878	Tray
17	24506879	Cover,gear
18	838426108	2.6TTB+10B(BC),Self-tapping screw
19	8761301008	W3×10F,Washer
20	24506882	Gear,drive
21	24506883	Cam,control
22	834120049	2TTS+4C,Self-tapping screw
23	25065374	Leafswitch
24	870144	Washer
25	27301227	Gear,middle
26	24602507	Belt
27	24506884	Pulley,loading
28	838426038	2.6TTB+3C(BC),Self-tapping screw
29	24506886	Motor
30	24505269	Motor pc board
31	27301228	Holder,tray,front
32	833120047	M2×4,Self-tapping screw
33	27301230	Holder,tray,rear
34	24506887	Guide,tray,right
35	24506888	Guide,tray,left
36	838430108	3TTB+10B(BC),Self-tapping screw
37	24506889	Boss,mount,right (for transport)
38	24506890	Boss,mount,back (for transport)
39	24506891	Boss,mount,left (for transport)
40	24506892	Plate,ring
41	24506893	Boss
42	24506894	Link,stopper
43	24506895	Spacer
44	83112608	2.6TTW+8S,Self-tapping screw
45	25050393	NCNT-5220,Connector
46	24506897	Damper
47	27301224	Chassis,main
48	24506898	Chassis,sub
49	28140980	Adhesive tape,front

REMOVEMENT OF DISC TRAY



1. Loosen the screw for stopper until the head of screw and tray are the same height.
2. Turn POWER switch to on.
3. Press OPEN/CLOSE button to open the tray.
4. Turn POWER switch to off.
5. Remove the tray.

CHASSIS-EXPLODED VIEW


P901
19
4
76
5
19
18
T901
21
10
21
7
P902
19
22
U1
21
33
31
33
21
21
U2
U3
20
74
73
21
U4
81
72
Z1
20
71
1
8
13
69
61
55
6
51
69
62
68
19
54

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	27100207B	Chassis
4	27121329-2	Back panel
5	⚠ 27300750	Bushing (Strainrelief)
6	27190524	Holder
7	27273125A	Joint, power
8	27190753A	Holder, mechanism
10	27141397	Bracket S
13	27110551B	Front bracket <B>
13	27110552B	Front bracket <S>
18	830440089	4TTC+8C (BC), Self-tapping screw
19	834430088	3TTS+8B (BC), Self-tapping screw
20	833430080	3TTP+8P (BC), Self-tapping screw
21	831130088	3TTW+8B, Self-tapping screw
22	87643010	W3×10F (BC), Washer
31	28184452	Top cover <B>
31	28184453	Top cover <S>
33	834430088	3TTS+8B (BC), Self-tapping screw
51	1H109121	Front panel ass'y <B>
	1H110121	Front panel ass'y <S>
54	27211175	Tray panel <B>
	27211176	Tray panel <S>
55	28140546	Cushion
61	28191551	Clear plate
62	27175153-1	Leg
68	833430088	3TTS+8B (BC), Self-tapping screw
69	833430080	3TTP+8P (BC), Self-tapping screw
71	260221	NK-10N, Clamp
72	29360807	Label, DANGER
73	29361218	Label, LASER
74	29360811A	Label
76	29360687	Label, CLASS 1
81	28175158A	Insulator plate
P901	⚠ 253148 or	AS-CEE 250V 2.5A
	⚠ 253150	Power supply cord
P902	230907	TR-16-8-16, Core
S1	2000951	NSAS-8P903, Socket
S2	2000952	NSAS-8P904, Socket
S3	2002390810	NSAS-8P0120, Socket
S4	2002391020	NSAS-10P0119, Socket
T901	⚠ 2300292 or	NPT-991G or
	⚠ 2300554	NPT-1072G, Power transformer

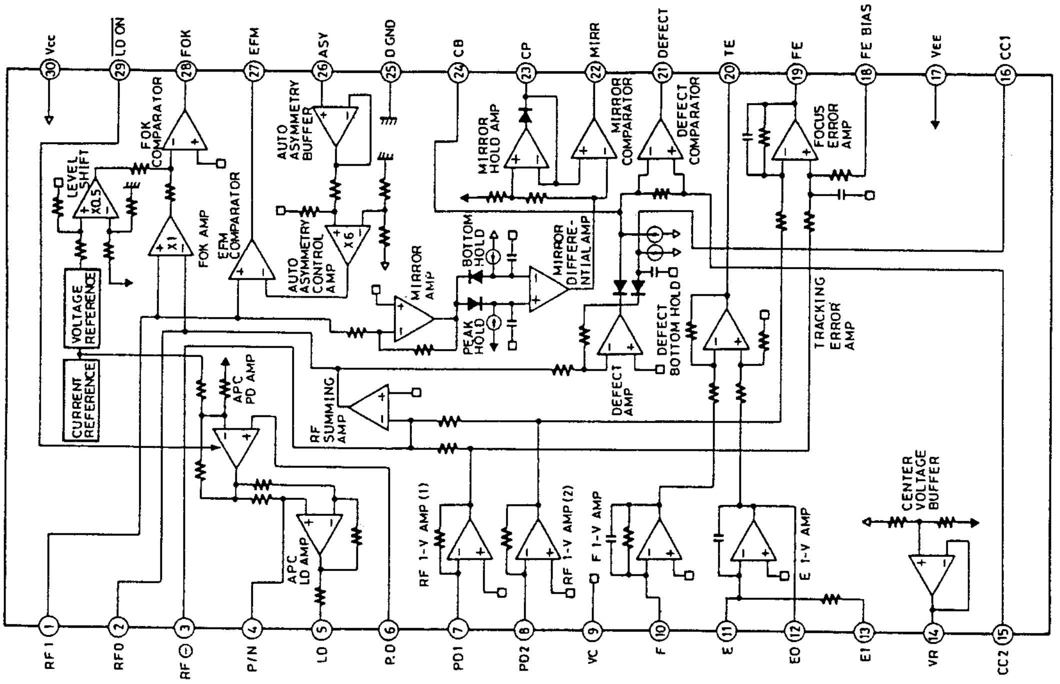
REF.NO.	PART NO.	DESCRIPTION
U1	1H107535-1A	NAAR-3835-1a, Main circuit pc board ass'y
U2	1H107536-1	NADIS-3836-1, Display circuit pc board ass'y
U3	1H107537-1A	NAAF-3837-1a, Headphone amplifier pc board ass'y
U4	1H107538-1	NAPS-3838-1, Power supply pc board ass'y
Z1	24506792	NCD-110S, CD mechanism ass'y
	260208	Binder

NOTE: <B>: Only Black model
<S>:Only Silver model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

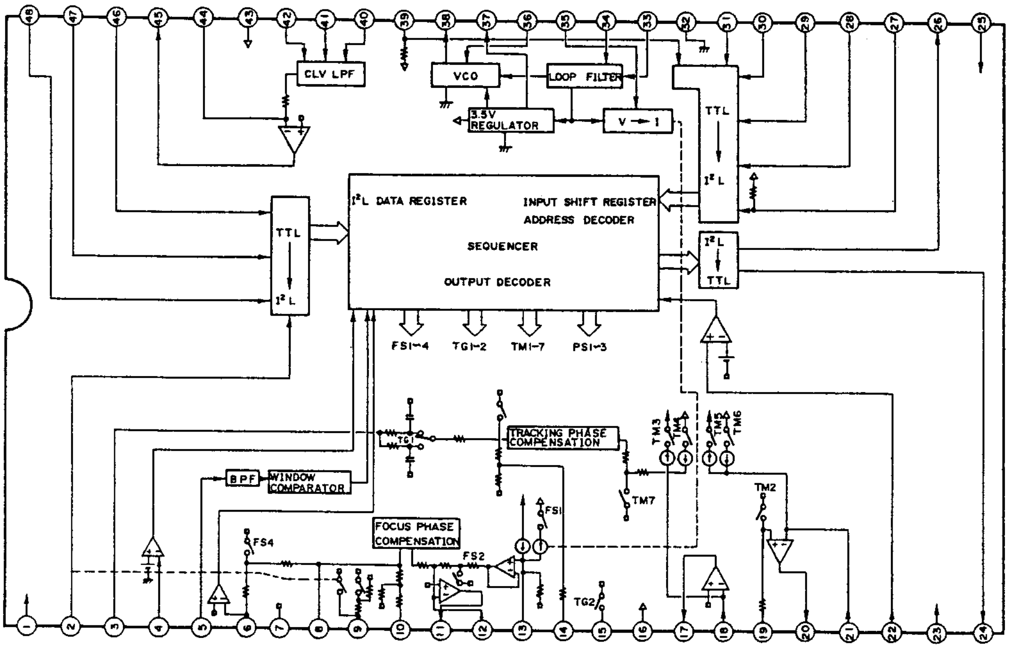
IC BLOCK DIAGRAM AND DESCRIPTIONS

Q102
CXA1081S (RF Amplifier)


30 Vcc
29 LD ON
28 FOK
27 EFM
26 ASY
25 D GND
24 CB
23 CP
22 MIRR
21 DEFECT
20 TE
19 FE
18 FE BIAS
17 VEE
16 CC1
FOK COMPARATOR
LEVEL SHIFT
X0.5
X1
FOK AMP
EFM COMPARATOR
AUTO ASYMMETRY BUFFER
AUTO ASYMMETRY CONTROL AMP
X6
MIRROR HOLD AMP
MIRROR AMP
BOTTOM HOLD
PEAK HOLD
MIRROR DIFFERE-NTIAL AMP
MIRROR COMPARATOR
DEFECT COMPARATOR
DEFECT BOTTOM HOLD
DEFECT AMP
FOCUS ERROR AMP
TRACKING ERROR AMP
VOLTAGE REFERENCE
CURRENT REFERENCE
APC PD AMP
APC LD AMP
RF SUMMING AMP
RF I-V AMP (1)
RF I-V AMP (2)
F I-V AMP
E I-V AMP
CENTER VOLTAGE BUFFER
1 RF I
2 RFO
3 RF ⊖
4 P/N
5 LD
6 P.D
7 PD1
8 PD2
9 VC
10 F
11 E
12 EO
13 E1
14 VR
15 CC2

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	RF I	Input terminal of output signal of RF summing amplifier via the coupling capacitor	16	CC1	Defect bottom hold output terminal
2	RFO	Output terminal of RF summing amplifier	17	V_{EE}	Negative power supply terminal
3	RF–	Input terminal of RF summing amplifier feedback	18	FE BIAS	Non-inversion bias terminal of focus error amplifier CMR adjustment of focus error amplifier
4	P/N	Switching terminal of P-SUB/N-SUB of LD (laser diode)	19	FE	Output terminal of focus error amplifier
5	LD	Output terminal of APC LD amplifier	20	TE	Output terminal of tracking error amplifier
6	PD	Input terminal of APC PD (Pin diode) amplifier	21	DEFECT	Output terminal of defect comparator
7	PD1	Inversion input terminal of RF I-V amplifier (1) Connect to A+C of PIN diodes.	22	MIRR	Output terminal of mirror comparator
8	PD2	Inversion input terminal of RF I-V amplifier (2) Connect to B+D of PIN diodes.	23	CP	Connection terminal of capacitor for mirror hold Non-inversion input of mirror comparator
9	VC	Connect to GND.	24	CB	Connection terminal of capacitor for defect bottom hold
10	F	Inversion input terminal of F I-V amplifier Connect to F of PIN diode.	25	DGND	Connect to GND
11	E	Inversion input terminal of E I-V amplifier Connect to E of PIN diode.	26	ASY	Auto asymmetry control input terminal
12	E0	Output terminal of E I-V amplifier	27	EFM	Output terminal of EFM comparator
13	E1	Feedback input terminal of E I-V amplifier Gain adjustment of E I-V amplifier	28	FOK	Output terminal of FOK comparator
14	VR	DC voltage output terminal of $(V_{cc} + V_{EE})/2$	29	$\overline{\text{LD ON}}$	ON/OFF switching terminal of laser diode
15	CC2	Input terminal from defect bottom hold output signal via the coupling capacitor	30	Vcc	Positive power supply

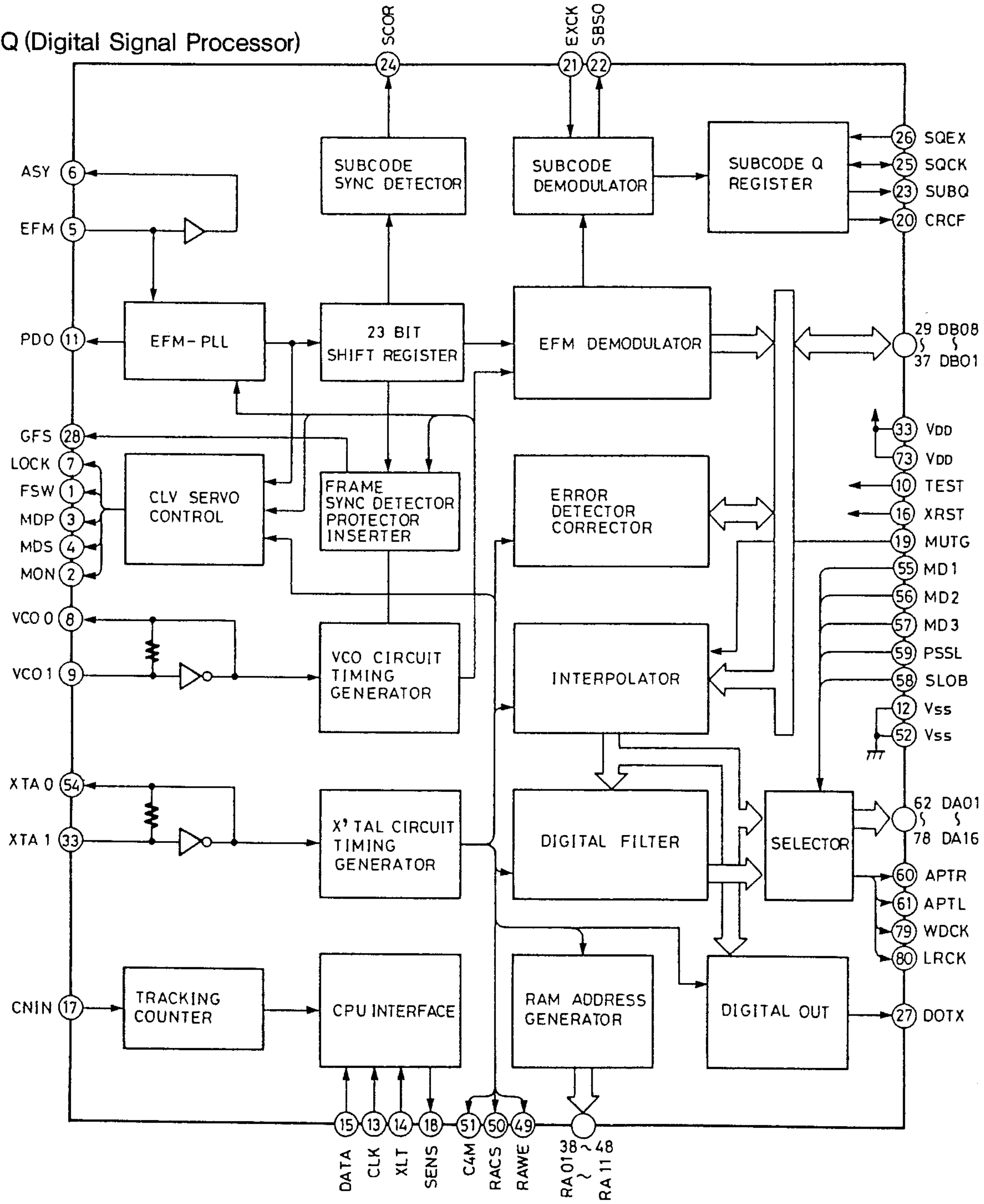
Q104
CXA1082BS (Servo Signal Processor)



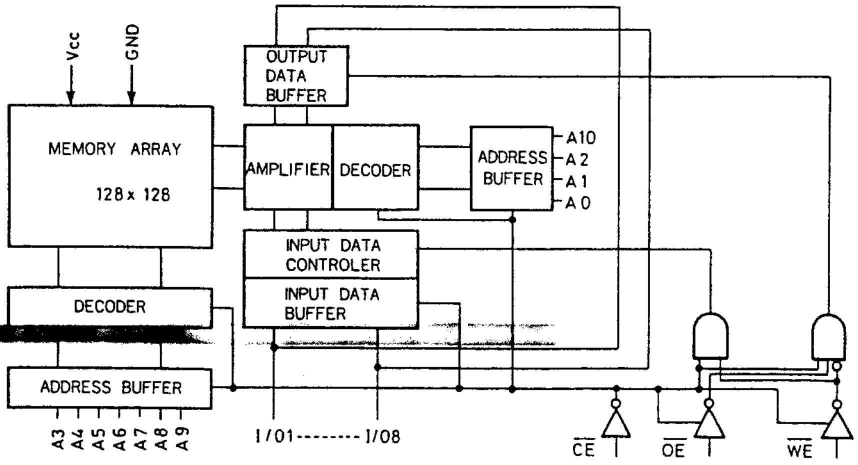
Pin No.	Symbol	Function
2	DECT	Defect signal input terminal.
3	TE	Tracking error signal input terminal.
4	TZC	Tracking zero cross comparator input terminal.
5	ATSC	Window comparator input terminal for ATSC detection.
6	FE	Focus error singal input terminal.
8	FGD	Insert the capacitor between this terminal and pin 9 when drop the high frequency gain of focus servo.
9	FS3	Switching terminal of high frequency gain of focus servo.
10	FLB	Time constant switching terminal when raise the low frequency gain of focus servo.
11	FEO	Focus drive output terminal.
12	FE−	Inversion input terminal of focus amplifier.
13	SRCH	Time constant terminal to make the fous search waveform.
14	TGU	Time constant terminal for high frequency gain switching of tracking.
15	TG2	Time constant terminal for high frequency gain switching of tracking.
17	TAO	Tracking drive output terminal.
18	TA−	Inversion input terminal of tracking amplifier.
19	SL+	Non-inversion input terminal of sled amplifier.
20	SLO	Sled drive output terminal.
21	SL−	Inversion input terminal of sled amplifier.
22	SSTOP	Limit switch ON/OFF detector signal terminal for disc innermost position detector.
23	FSET	Terminal for peak of phase compensation of tracking and f0 setting LPF.
24	SENS	FZC, AS, TZC, SSTOP and etc. signals are output by the command from microprocessor.

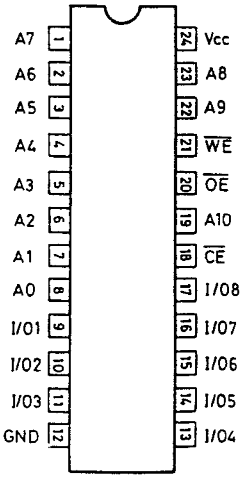
Pin No.	Symbol	Function
26	C. OUT	Signal output terminal for count of track numbers.
27	DIRC	Use when jumps one track.
28	XRST	Reset input terminal. Reset at the low level.
29	DATA	Serial data input terminal from microprocessor.
30	XLT	Latch input terminal from microprocessor.
31	CLK	Clock input terminal serial data transmitter from microprocessor.
33	BW	Time constant terminal of loop filter.
34	PDI	Input terminal of phase comparator output PDO.
35	ISET	Flow the current to decide the focus search, track jump, and kick height.
36	VCOF	VCO free run frequency is proportion to resistor value between pins 31 and 37.
38	C864	VCO (8.64MHz) output terminal.
39	LOCK	Sled motor run away prevention circuit is operated at low level.
40	MDP	Connection terminal to terminal MDP of CXD1130Q.
41	MON	Connection terminal to terminal MON of CXD1130Q.
42	FSW	LPF time constant terminal of CLV servo error signal.
44	SPDL−	Inversion input terminal of spindle drive amplifier.
45	SPDLO	Spindle drive output terminal.
46	WDCK	Clock input terminal. (88.2kHz)
47	FOK	Focus OK input terminal.
48	MIRR	Mirror signal input terminal.

Q108
CXD1130Q (Digital Signal Processor)


SCOR 24
EXCK 21
SBSO 22
SUBCODE SYNC DETECTOR
SUBCODE DEMODULATOR
SUBCODE Q REGISTER
26 SQEX
25 SQCK
23 SUBQ
20 CRCF
ASY 6
EFM 5
PDO 11
EFM-PLL
23 BIT SHIFT REGISTER
EFM DEMODULATOR
29 DB08 ~ 37 DB01
GFS 28
LOCK 7
FSW 1
MDP 3
MDS 4
MON 2
CLV SERVO CONTROL
FRAME SYNC DETECTOR PROTECTOR INSERTER
ERROR DETECTOR CORRECTOR
33 VDD
73 VDD
10 TEST
16 XRST
19 MUTG
55 MD1
56 MD2
57 MD3
59 PSSL
58 SLOB
12 Vss
52 Vss
VCO 0 8
VCO 1 9
VCO CIRCUIT TIMING GENERATOR
INTERPOLATOR
XTA 0 54
XTA 1 33
X'TAL CIRCUIT TIMING GENERATOR
DIGITAL FILTER
SELECTOR
62 DA01 ~ 78 DA16
60 APTR
61 APTL
79 WDCK
80 LRCK
CNIN 17
TRACKING COUNTER
CPU INTERFACE
RAM ADDRESS GENERATOR
DIGITAL OUT
27 DOTX
15 DATA
13 CLK
14 XLT
18 SENS
51 C4M
50 RACS
49 RAWE
38 ~ 48 RA01 ~ RA11

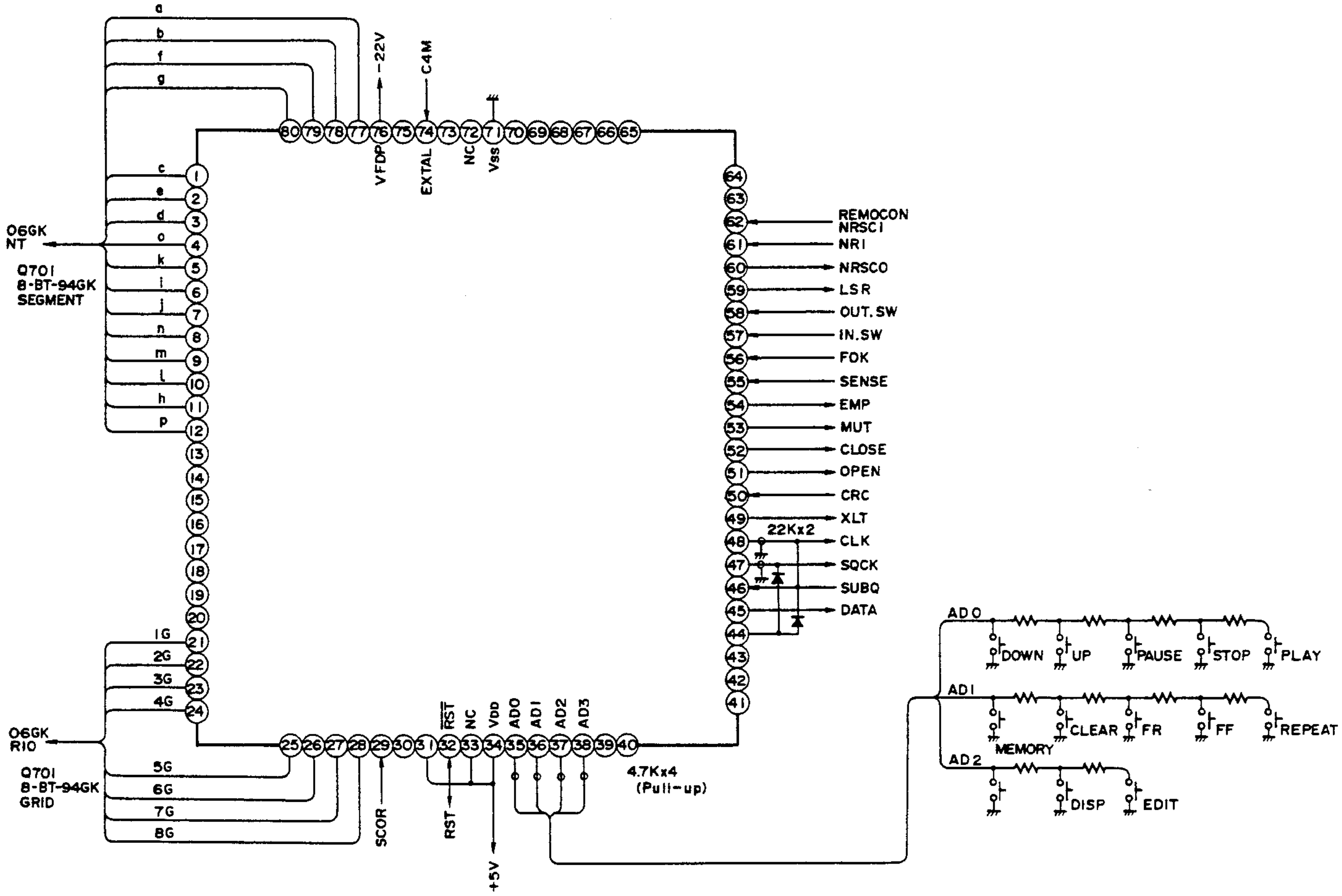
Q109
CXK5816SPS-15L etc. (16k RAM)


Vcc
GND
MEMORY ARRAY 128 x 128
OUTPUT DATA BUFFER
AMPLIFIER
DECODER
ADDRESS BUFFER
A10
A2
A1
A0
INPUT DATA CONTROLER
INPUT DATA BUFFER
DECODER
ADDRESS BUFFER
A3 A4 A5 A6 A7 A8 A9
I/01 -------- I/08
CE
OE
WE

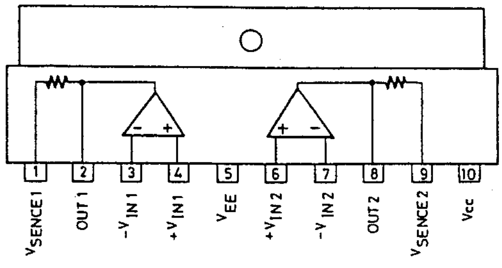

A7 1
A6 2
A5 3
A4 4
A3 5
A2 6
A1 7
A0 8
I/01 9
I/02 10
I/03 11
GND 12
24 Vcc
23 A8
22 A9
21 WE
20 OE
19 A10
18 CE
17 I/08
16 I/07
15 I/06
14 I/05
13 I/04

Pin No.	Symbol	Function
1	FSW	Time constant switching output terminal of output filter of spindle motor
2	MON	ON/OFF control output terminal of spindle motor
3	MDP	Drive output terminal of spindle motor. Rough control when mode CLV-S and phase control when mode CLV-P
4	MDS	Drive output terminal of spindle motor. Speed control when mode CLV-P
5	EFM	EFM signal input terminal from RF amplifier
6	ASY	Output terminal to control the slice level of EFM signal
7	LOCK	GFS sampling terminal
8	VCOO	VCO output terminal. 8.6436MHz when lock to EFM signal
9	VCOI	VCO input terminal
10	TEST	0V
11	PDO	Phase comparator output terminal of EFM signal and VCO/2
12	Vss	Ground
13	CLK	Serial data transmitter clock input terminal from microcomputer
14	XLT	Latch input terminal from microcomputer
15	DATA	Serial data input terminal from microcomputer
16	XRST	System rest input terminal. Reset at low level.
17	CNIN	Tracking pulse input terminal
18	SENS	Inner condition output terminal correspond to address
19	MUTG	Muting input terminal
20	CRCF	CRC check output terminal of subcode Q
21	EXCK	Clock input terminal for serial output of subcode
22	SBSO	Serial output terminal of subcode
23	SUBQ	Subcode Q output terminal
24	SCOR	Subcode sink S0 + S1 output terminal
25	SQCK	Clock terminal to read the subcode Q
26	SQEX	Selector input terminal of SQCK
27	DOTX	Digital output terminal
28	GFS	Indicator output of lock condition of frame sync
29 32	DB08 ≀ DB05	Data terminals of external RAM
33	V_{DD}	+5V
34 37	DB04 ≀ DB01	Data terminals of external RAM
38 48	RA01 ≀ RA11	Address output terminals of external RAM
49	RAWE	Write enable signal output to external RAM
50	RACS	Chip selector signal output to external RAM
51	C4M	Divider output of crystal. f=4.2336MHz
52	Vss	Ground
53	XTAI	Input terminal of crystal oscillator
54	XTAO	Output terminal of crystal oscillator
55 57	MD1 ≀ MD3	Mode switching input terminals
58	SLOB	Code switching input of audio data output.
59	PSSL	Mode switching input of audio data output. Serial output at low level. Parallel output at high level
60	APTR	Control output for aperture correction. High level when Rch.
61	APTL	Control output for aperture correction. High level when Lch.
62	DA01	DA01 (LSB of parallel sound output) output when PSSL = H. C1F1 output when PSSL = L
63	DA02	DA02 output when PSSL = H. C1F2 output when PSSL = L.
64	DA03	DA03 output when PSSL = H. C2F1 output when PSSL = L.
65	DA04	DA04 output when PSSL = H. C2F2 output when PSSL = L.
66	DA05	DA05 output when PSSL = H. C2FL output when PSSL = L.
67	DA06	DA06 output when PSSL = H. C2PO output when PSSL = L.
68	DA07	DA07 output when PSSL = H. RFCK output when PSSL = L.
69	DA08	DA08 output when PSSL = H. WFCK output when PSSL = L.
70	DA09	DA09 output when PSSL = H. PLCK output when PSSL = L.
71	DA10	DA10 output when PSSL = H. UGFS output when PSSL = L.
72	DA11	DA11 output when PSSL = H. GTOP output when PSSL = L.
73	V_{DD}	Power supply (5V)
74	DA12	DA12 output when PSSL = H. RAOV output when PSSL = L.
75	DA13	DA13 output when PSSL = H. C4LR output when PSSL = L.
76	DA14	DA14 output when PSSL = H. C210 output when PSSL = L.
77	DA15	DA15 output when PSSL = H. C210 output when PSSL = L.
78	DA16	DA16 (MSB of parallel sound output) output when PSSL = H. DATA output when PSSL = L
79	WDCK	Strobe signal output. 176.4kHz when DF is on. 88.2kHz when DF is off.
80	LRCK	Strobe signal output. 88.2kHz when DF is on. 44.1kHz when DF is off.

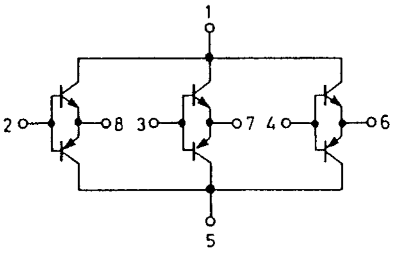
Q114
CXP50112-114Q (Microprocessor)


a
b
f
g
−22V
C4M
VFDP
EXTAL
NC
Vss
c
e
d
o
k
i
j
n
m
l
h
p
06GK
NT
Q701
8-BT-94GK
SEGMENT
1G
2G
3G
4G
5G
6G
7G
8G
06GK
R10
Q701
8-BT-94GK
GRID
SCOR
RST
NC
VDD
AD0
AD1
AD2
AD3
RST
+5V
4.7Kx4
(Pull-up)
REMOCON
NRSCI
NRI
NRSCO
LSR
OUT.SW
IN.SW
FOK
SENSE
EMP
MUT
CLOSE
OPEN
CRC
XLT
22Kx2
CLK
SQCK
SUBQ
DATA
AD0
DOWN
UP
PAUSE
STOP
PLAY
AD1
MEMORY
CLEAR
FR
FF
REPEAT
AD2
DISP
EDIT

Q105
LA6510 (Motor Drive)

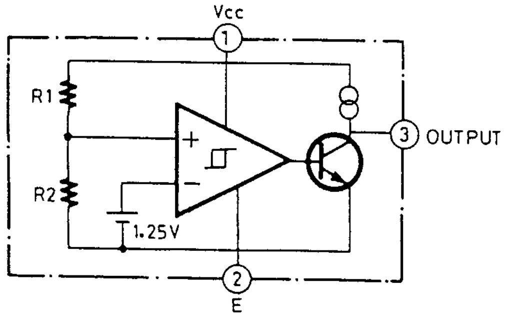

1
2
3
4
5
6
7
8
9
10
VSENCE1
OUT1
−VIN1
+VIN1
VEE
+VIN2
−VIN2
OUT2
VSENCE2
Vcc

Q106
STA341M-L (Transistor Array)



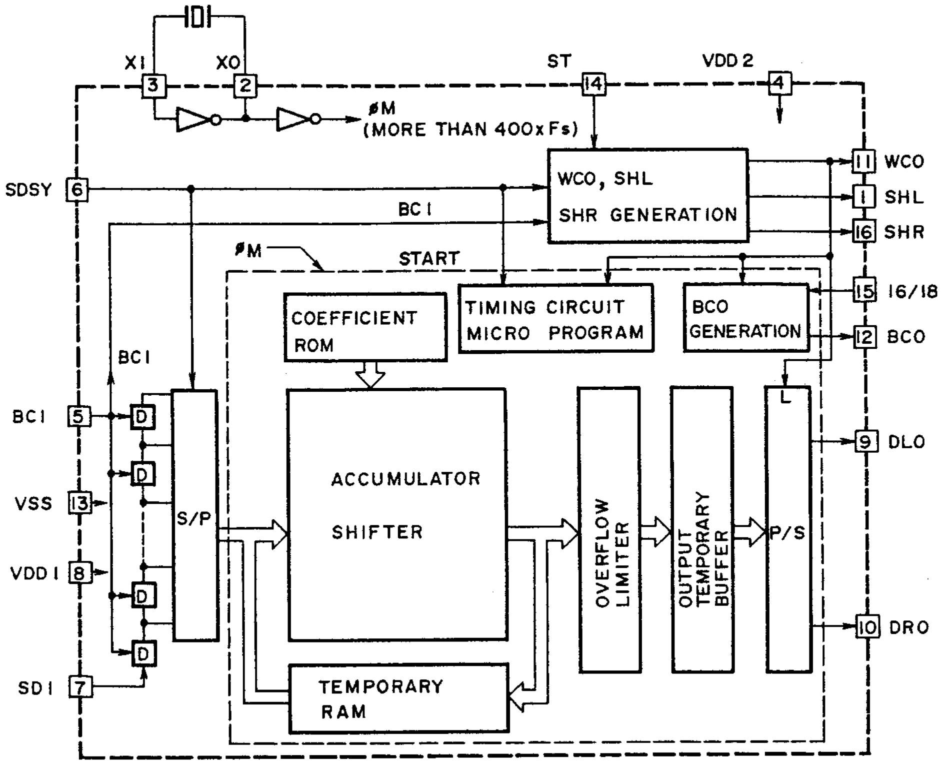
Pin No.	Symbol	I/O	Function
1~12	c~e,h~p	O	Fluorescent tube segment drive output terminals.
21~28	1G~8G	O	Fluorescent tube grid drive output terminals.
29	SCOR	I	Subcode SQ+SI input terminal.
32	RST	I	Reset input terminal.Reset at "L".
34	VDD		Power supply terminal.Connect to 5V.
35~38	AD0~AD3	I	AD input terminals.Connect the operation keies.
45	DATA	O	Serial data signal output terminal.
46	SUBQ	I	Subcode Q input terminal.
47	SQCK	I/O	Subcode Q read clock.
48	CLK	O	Serial data transmission clock output terminal.
49	XLT	O	Command execution output terminal.
50	CRC	I	Subcode check input terminal.
51	OPEN	O	Tray motor control output terminal.Tray opens at "H".
52	CLOSE	O	Tray motor control output terminal.Tray closes at "H".
53	MUT	O	Muting ON/OFF output terminal.Muting switch turns on at "H".
54	EMP	O	Emphasis ON/OF output terminal.Emphasis switch turns on at "H".
55	SENSE	I	Interface of signal processor and microprocessor ICs.
56	FOK	I	Focus OK input terminal.Focus OK at "H".
57	IN SW	I	Tray close detection input terminal.
58	OUT SW	I	Tray open detection input terminal.
59	LSR	O	Optical pickup control output terminal.Optical pickup turns on at "L".
60	NRSCO	O	Remote control signal output terminal.
61	NRI	I	RI signal input terminal.
62	NRSI	I	Remote control signal input terminal.
74	C4M	I	System clock input terminal.(4.2336MHz)
76	VFDP		Power supply terminal.Connect to -22V.
77~80	a,b,f,g	O	Fluorescent tube segment drive output terminals.

Q115
M51943ASL (Rest IC)



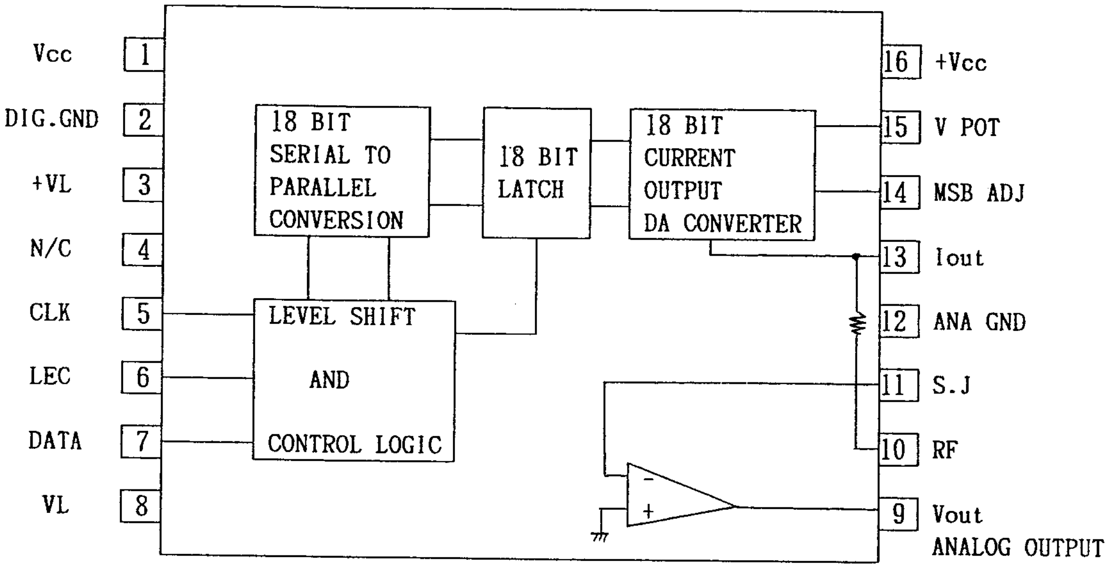
Q116

YM3433 (18 bits/8 times Oversampling Digital Filter)


XI
XO
3
2
ST
14
VDD 2
4
φM
(MORE THAN 400xFs)
SDSY
6
WCO, SHL
SHR GENERATION
11
WCO
1
SHL
16
SHR
BC I
φM
START
COEFFICIENT ROM
TIMING CIRCUIT MICRO PROGRAM
BCO GENERATION
15
16/18
12
BCO
BC I
BC I
5
D
VSS
13
VDD I
8
SD I
7
S/P
ACCUMULATOR
SHIFTER
OVERFLOW LIMITER
OUTPUT TEMPORARY BUFFER
L
P/S
9
DLO
10
DRO
TEMPORARY RAM

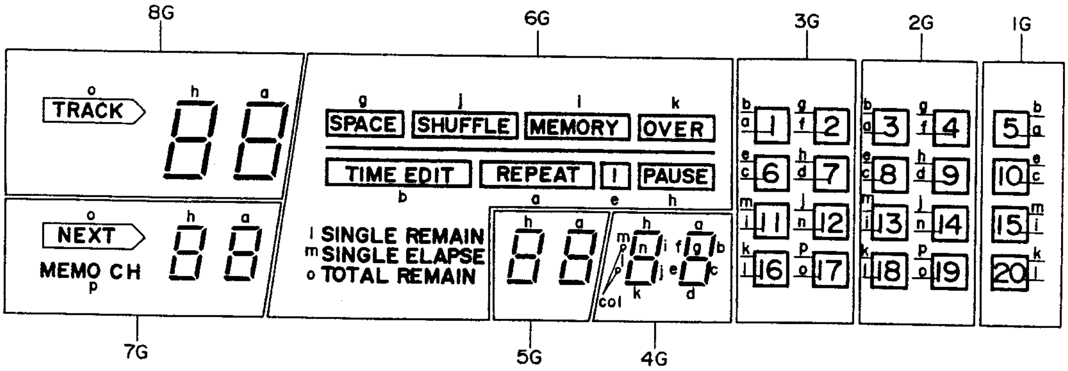
Pin No.	Terminal	Function
1	SHL	ST=L(1 DAC):L channel deglitch signal output. ST=H(2 DACs):L and R channels deglitch signal output. (Not used.)
2 3	XO XI	Connect the crystal oscillator for the system clock to these terminals.
4	VDD2	Power supply terminal for crystal oscillator and deglitch signal system.
5	BCI	Bit clock input terminal of input data.
6	SDSY	Clock input terminal to show the input timing and L/R channels partitioned of input data.
7	SDI	Data input terminal.
8	VDD1	Power supply terminal.(Connect to 5V.)
9	DLO	ST=L(1 DAC):L and R channels data output terminal. ST=H(2 DAC):L channel data output terminal.
10	DRO	R channel data output terminal.
11	WCO	Word clock output terminal for output data DLO/DRO.
12	BCO	Bit clock output terminal for output data DLO/DRO.
13	VSS	Ground terminal.
14	ST	1 DAC/2 DAC selection terminal.(1 DAC at low level and ~~2 DAC at high level.)~~
15	16/18	Bit number selection terminal.(16 bits at low level and 18 bits at high level.)
16	SHR	1 DAC(ST=L):R channel deglitch signal output.(Not used.)

Q117, Q118
PCM61P (DA Converter)


Vcc
1
DIG.GND
2
+VL
3
N/C
4
CLK
5
LEC
6
DATA
7
VL
8
18 BIT SERIAL TO PARALLEL CONVERSION
18 BIT LATCH
18 BIT CURRENT OUTPUT DA CONVERTER
LEVEL SHIFT AND CONTROL LOGIC
16
+Vcc
15
V POT
14
MSB ADJ
13
Iout
12
ANA GND
11
S.J
10
RF
9
Vout
ANALOG OUTPUT
-
+

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	-Vcc	Analog negative power supply	16	+Vcc	Analog positive power supply
2	DIG GND	Digital ground	15	VPOT	Potential meter output
3	+VL	Logic positive power supply	14	MSB ADJ	MSB adjustment terminal
4	NC	No connection	13	Iout	Current output
5	CK	Clock input	12	ANA GND	Analog ground
6	LEC	Latch enable control input	11	S.J	Summing junction (Operation amplifier input)
7	DATA	Data input	10	RF	Feedback resistor
8	-VL	Logic negative power supply	9	Vout	Voltage output(Analog output)

Q701
8-BT-94GK (Fluorescent Tube)


8G
6G
3G
2G
IG
TRACK
NEXT
MEMO CH
SPACE
SHUFFLE
MEMORY
OVER
TIME EDIT
REPEAT
PAUSE
l SINGLE REMAIN
m SINGLE ELAPSE
o TOTAL REMAIN
col
7G
5G
4G
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CONNECTION	F1	F1	NP	8G	7G	6G	5G	4G	3G	2G	1G	q	p	h	i	NP
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
CONNECTION	NP	NP	NP	NP	NP	NP	NP	m	n	j	ℓ	k	o	d	e	c
PIN NO.	33	34	35	36	37	38	39									
CONNECTION	g	f	b	a	NP	F2	F2									

Note:NP····No pin 1G~8G····Grid
F1,F2····Filament

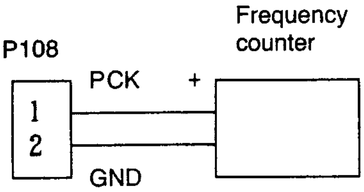
ADJUSTMENT PROCEDURES

Instruments required

Dual trace oscilloscope, Frequency counter, AF oscillator, Test disc (SONY YEDS-18), AC voltmeter, Jitter meter, and Socket P4(Part no. 25050138)

1. VCO frequency adjustment

Connect the frequency counter to terminal P108.
Turn the power switch to ON.(No load the disc.)
Adjust R154 until the frequency counter reading becomes 4322 ±5kHz.
After adjustment, disconnect the frequency counter.



2. Focus offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.
Connect the oscilloscope or jitter meter to terminal P106.
(Oscilloscope)
Adjust R110 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.
When the amount of jitter is broad, set R110 to mechanical center.
(Jitter meter)
Adjust R110 until the jitter meter reading becomes minimum.(Less than 10ns.)
After adjustment, disconnect the oscilloscope or jittter meter.

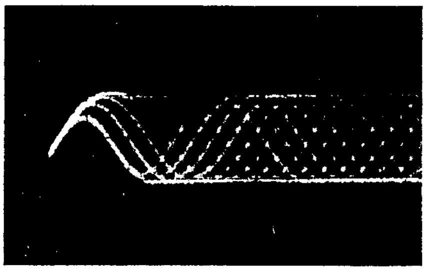
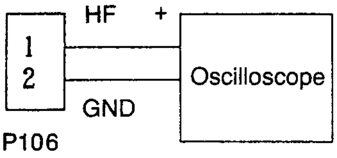
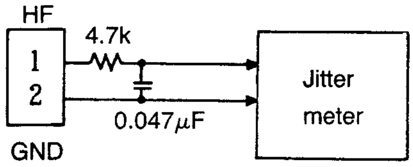


Photo 1



Oscilloscope range
Vertical : 0.5V/div.
Holizontal : 0.2 μs/div.
DC, Ground: Center



3. Tracking offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.
Turn R132 to minimum position.(Counter clockwise)
Connect the oscilloscope between pin 3 (TR) of P107 and pin 2 (GND) of P106.
Adjust R108 until the center of tracking error signal on the oscilloscope becomes GND level.
Turn R132 to the mechanical center.
After adjustment, disconnect the oscilloscope.

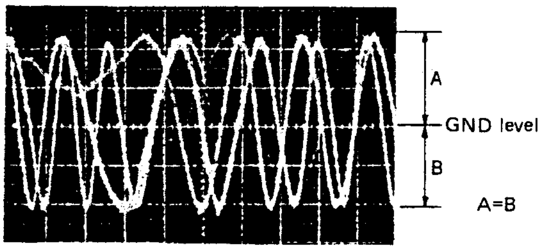
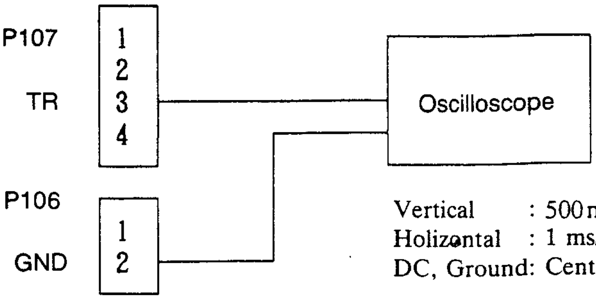


Photo 2



Vertical : 500mV/div.
Holizontal : 1 ms/div.
DC, Ground: Center

4. Focus gain adjustment

Set the output of AF oscillator to 800Hz, 1~1.5Vp-p.
Play the track 2 of test disc.
Connect the oscilloscope and the AF oscillator as shown below.

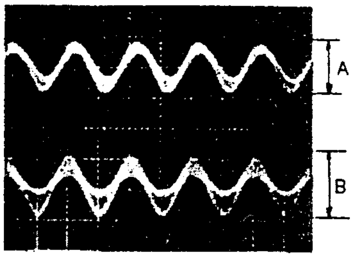
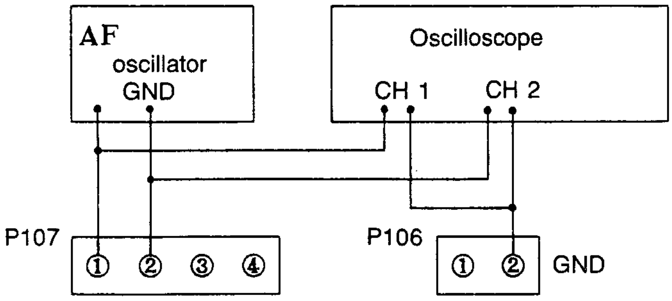


Photo 3


AF
oscillator
GND
Oscilloscope
CH 1
CH 2
P107
①
②
③
④
P106
①
②
GND

Vertical : 0.2V/div.
Holizontal: 0.5 ms/div.

Adjust R122 until 800Hz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF oscillator and the oscilloscope.

5. Tracking gain adjustment

Set the output of AF oscillator to 1.2kHz, 1~1.5Vp-p.
Play the track 2 of test disc.
Connect the oscilloscope and the AF oscillator as shown below.

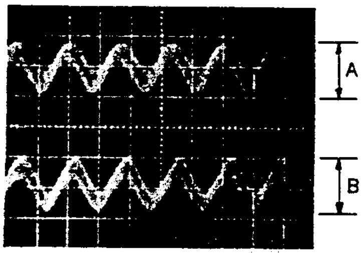
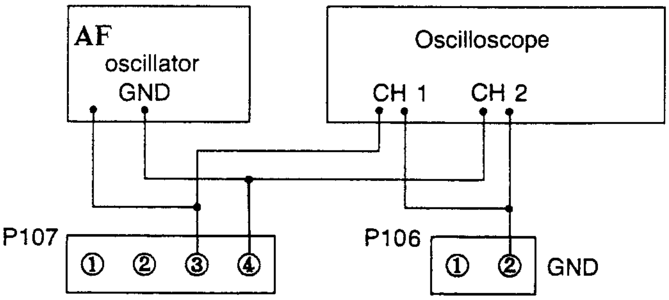


Photo 4


AF
oscillator
GND
Oscilloscope
CH 1
CH 2
P107
①
②
③
④
P106
①
②
GND

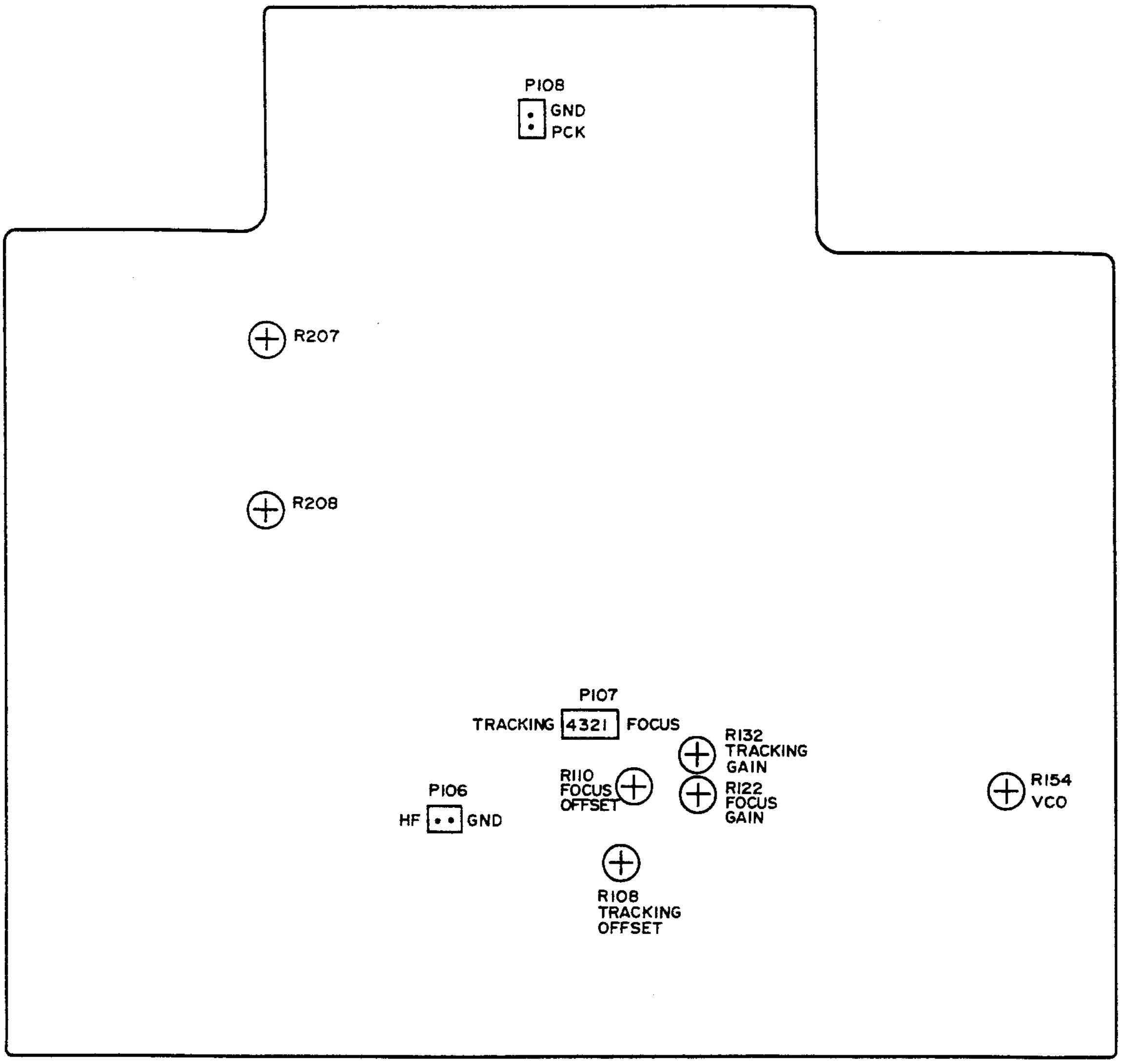
Vertical : 0.2V/div.
Holizontal: 0.5 ms/div.

Adjust R132 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF oscillator and the oscilloscope.

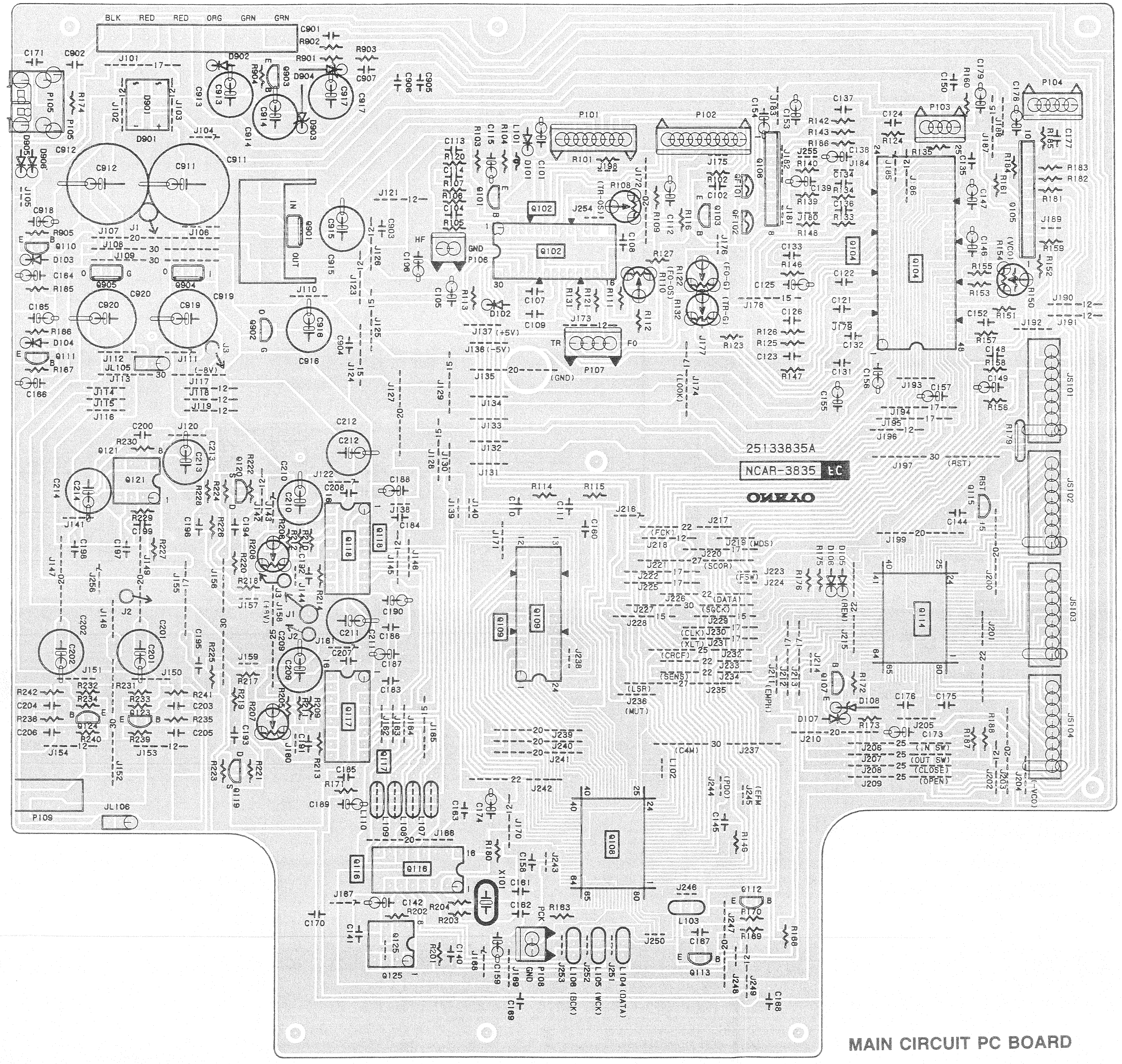
After adjustment, confirm that the center of tracking error signal becomes GND level.

6. Audio circuit adjustment

Connect the AC voltmeter to output terminal of left channel (right channel).
Load the test disc and play the track 2.
Next, play the track 17.
Adjust R207(R208) so that the output discrepancy between track 2 and track 17 is 60±0.25dB.


P108
GND
PCK
R207
R208
P107
TRACKING
4321
FOCUS
R132
TRACKING
GAIN
R110
FOCUS
OFFSET
R122
FOCUS
GAIN
R154
VCO
P106
HF
GND
R108
TRACKING
OFFSET

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE


BLK
RED
RED
ORG
GRN
GRN
J101
P101
P102
P103
P104
P106
P107
P108
P109
Q102
Q104
Q108
Q109
Q114
Q116
Q117
Q118
Q121
Q125
J5101
J5102
J5103
J5104
25133835A
NCAR-3835
EC
ONKYO
(GND)
(+5V)
(-5V)
(-8V)
(LOOK)
(FCK)
(MDS)
(SCOR)
(FSW)
(DATA)
(SQCK)
(CLK)
(XLT)
(CRCF)
(SENS)
(LSP)
(MUT)
(C4M)
(PDO)
(EFM)
(CMPH)
(ARM)
(RST)
(VCO)
(IN SW)
(OUT SW)
(CLOSE)
(OPEN)
(BCK)
(WCK)
(DATA)
PCK
GND
TR
FO
HF
IN
OUT

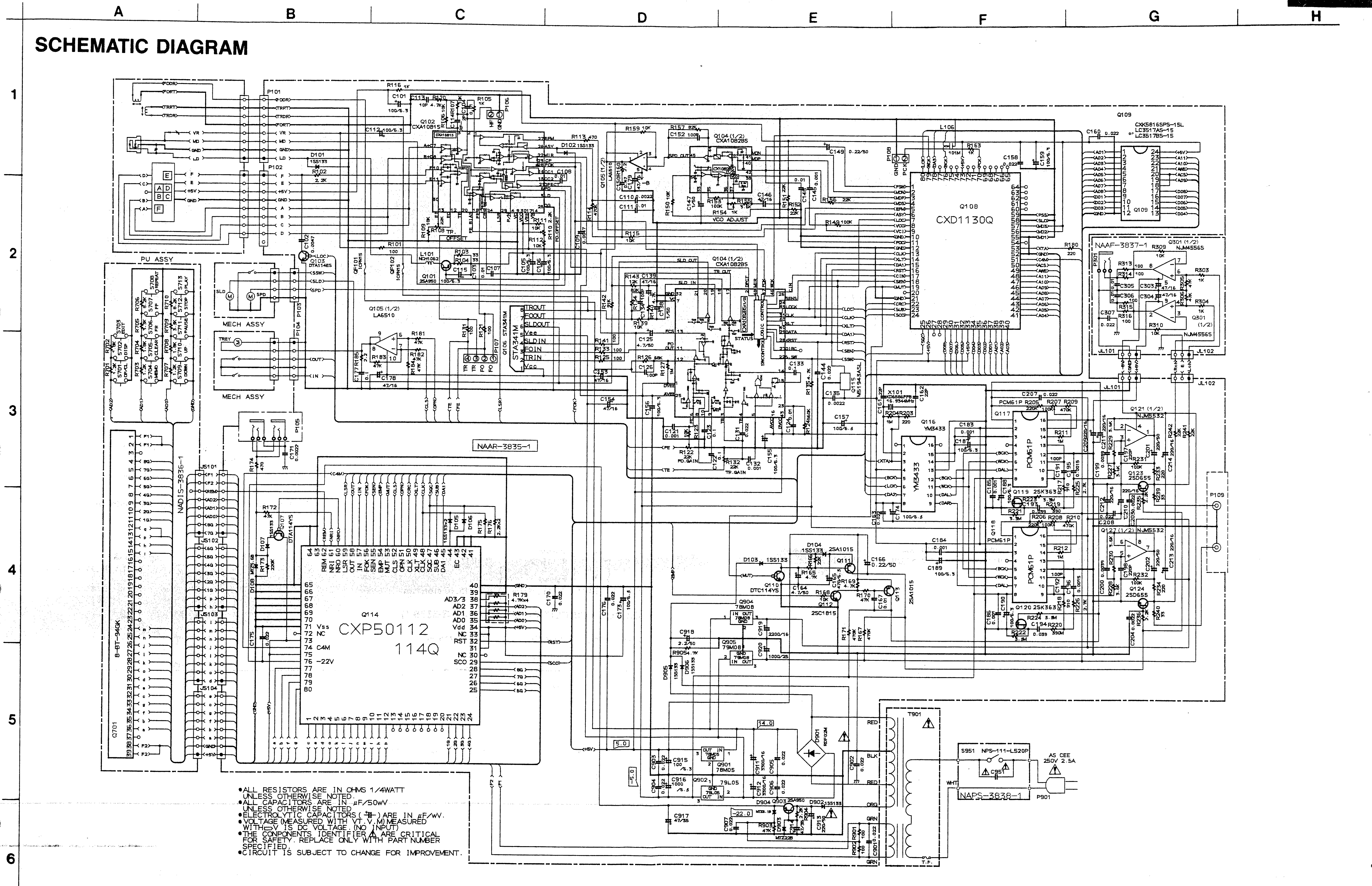
MAIN CIRCUIT PC BOARD

PARTS LIST

MAIN CIRCUIT PC BOARD(NAAR-3835-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q102	22240180	CXA1081S
Q104	22240263	CXA1082BS
Q105	22240034	LA6510
Q106	22240168	STA341M-L
Q108	22240095	CXD1130Q
Q109	22240178, 22240234 or 22240118	CXK5816SPS-15L, LC3517BS-15 or LC3517AS-15
Q114	22240320	CXP50112-114Q
Q115	22240018	M51943ASL
Q116	22240321	YM3433
Q117, Q118	22240324	PCM61P
Q121	222902	NJM5532D-D
Q901	222780055MIT	M5F78M05L
Q902	222790053	79L05
Q904	222780085MIT	M5F78M08
Q905	222790085MIT	M5F79M08
	Transistors	
Q101, Q903	2211503 or 2211504	2SA950-O or 2SA950-Y
Q103, Q110	2213290	DTC114ES
Q107	2212600	DTA124ES
Q111, Q113	2211455	2SA1015-GR
Q112	2211255	2SC1815-GR
Q119, Q120	2212524	2SK363-GR
Q123, Q124	2211705 or 2211706	2SD655-E or 2SD655-F
	Diodes	
D101-D107	223163	1SS133
D108	224450562	MTZ5.6B
D901	22380013	RDF02M
D902	223163	1SS133
D903	224452202	MTZ22B
D904	224450512	MTZ5.1B
D905, D906	223163	1SS133
	X'tal	
X101	3010112	KD6586FFB
	Coil	
L101	231023	NCH-1062
	Ferrite beads	
L102-L105	230906	BL02RN2-R62
L107-L110	230906	BL02RN2-R62
	Filter	
L106	3030002	DSS306-55B-101M

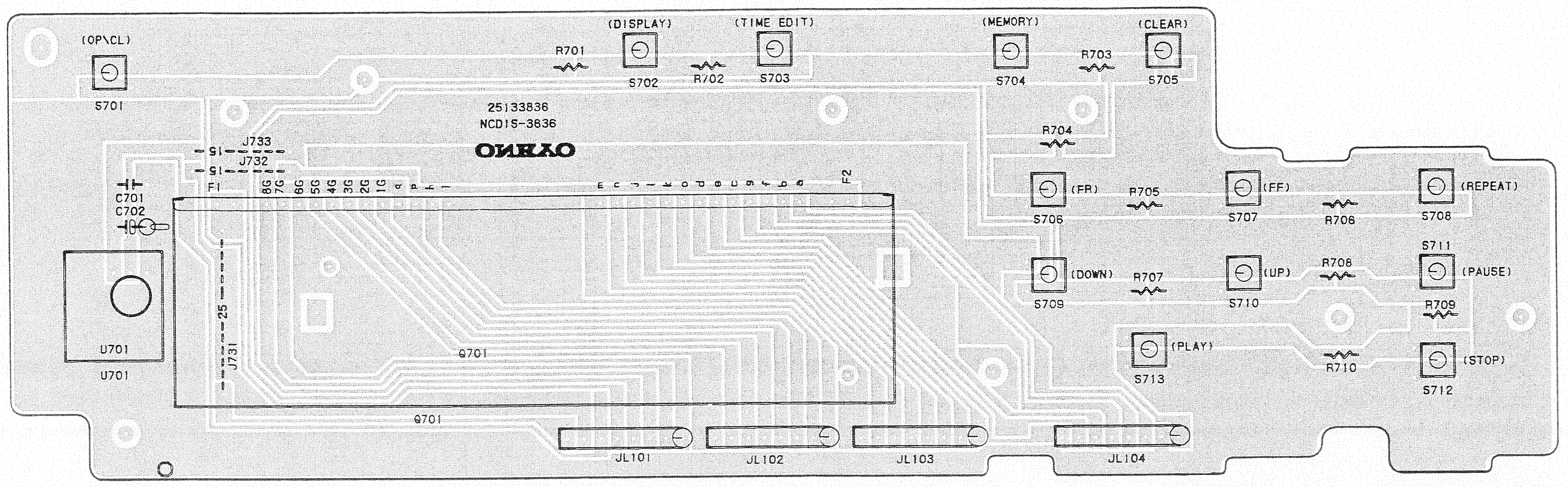
SCHEMATIC DIAGRAM


A
B
C
D
E
F
G
H
1
2
3
4
5
6
PU ASSY
MECH ASSY
MECH ASSY
P101
P102
P103
P104
P105
P106
P107
P108
P109
Q102 CXA1081S
Q103 DTA114ES
Q104 (1/2) CXA1082BS
Q105 (1/2) LA6510
Q106 STA341M
Q108 CXD1130Q
Q109 CXK5816SPS-15L or LC3517AS-15 LC3517BS-15
Q114 CXP50112 114Q
Q115 M51943ASL
Q116 YM3433
Q117 PCM61P
Q118 PCM61P
Q121 (1/2) NJM5532
Q127 (1/2) NJM5532
Q301 (1/2) NJM4556S
Q701 8-BT-94GK
NAAR-3835-1
NAAF-3837-1
NADIS-3836-1
NAPS-3838-1
JL101
JL102
JS101
JS102
JS103
JS104
T901
S951 NPS-111-L520P
AS CEE 250V 2.5A
P901
Q901 78M05
Q902 79L05
Q904 78M08
Q905 79M08
D901 RDF02M
VCO ADJUST
TR. OFFSET
FE BIAS
FO. OFFSET
FO. GAIN
TR. GAIN
X101 KDS686FPB 16.9344MHz
14.0
5.0
-5.0
-22.0
RED
BLK
WHT
ORG
GRN
T.F.

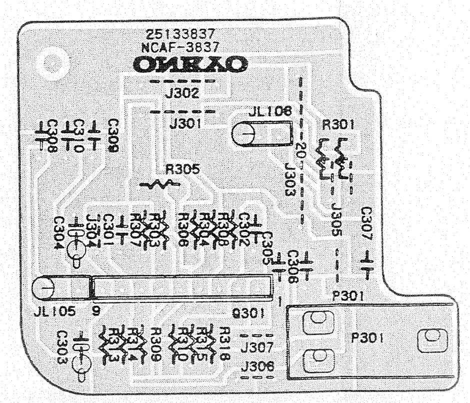
- ALL RESISTORS ARE IN OHMS 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF/50wV UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/wV.
- VOLTAGE (MEASURED WITH VT.V.M) MEASURED WITH ▭V IS DC VOLTAGE. (NO INPUT)
- THE CONPONENTS IDENTIFIER ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

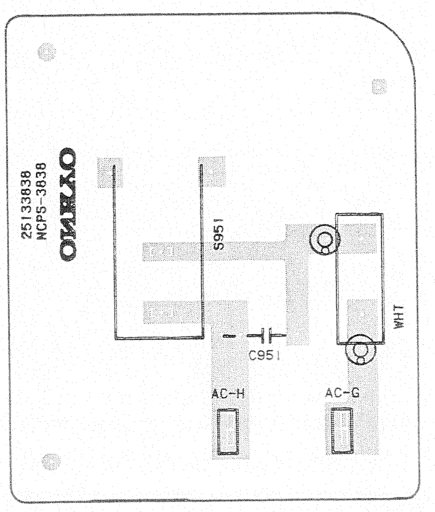
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE


(OP\CL)
S701
(DISPLAY)
S702
R701
R702
(TIME EDIT)
S703
(MEMORY)
S704
R703
(CLEAR)
S705
R704
25133836
NCD1S-3836
ONKYO
J733
J732
C701
C702
U701
J731
Q701
(FR)
S706
R705
(FF)
S707
R706
(REPEAT)
S708
(DOWN)
S709
R707
(UP)
S710
R708
S711
(PAUSE)
R709
(PLAY)
S713
R710
(STOP)
S712
JL101
JL102
JL103
JL104

DISPLAY CIRCUIT PC BOARD


25133837
NCAF-3837
ONKYO
J302
J301
JL106
R301
R305
C307
J305
J303
C304
C301
C302
C305
C306
JL105
Q301
P301
C303
J307
J306

HEADPHONE AMPLIFIER PC BOARD


25133838
NCPS-3838
ONKYO
S951
C951
WHT
AC-H
AC-G

POWER SUPPLY PC BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C101, C112	354721019	100 μF, 6.3V, Elect.
C102	371124724	4700pF 5%, 50V, Mylar
C104	371121034	0.01μF 5%, 50V, Mylar
C105, C106	354721019	100 μF, 6.3V, Elect.
C107, C108	371121034	0.01μF 5%, 50V, Mylar
C109	371124724	4700pF 5%, 50V, Mylar
C110	371122224	2200pF 5%, 50V, Mylar
C111	371121034	0.01μF 5%, 50V, Mylar
C115	354721019	100 μF, 6.3V, Elect.
C121	371121024	1000pF 5%, 50V, Mylar
C122, C123	371121044	0.1 μF 5%, 50V, Mylar
C124	371121034	0.01μF 5%, 50V, Mylar
C125	354780479	4.7 μF, 50V, Elect.
C131	371122234	0.022 μF 5%, 50V, Mylar
C132	371121024	1000pF 5%, 50V, Mylar
C133	371121044	0.1 μF 5%, 50V, Mylar
C138	354780109	1 μF, 50V, Elect.
C139, C146	354744709	47μF, 16V, Elect.
C147	354780109	1 μF, 50V, Elect.
C148	371123334	0.033 μF 5%, 50V, Mylar
C149	354782299	0.22μF, 50V, Elect.
C150	374724744	0.47μF 5%, 50V, Plastic(IF)
C153, C154	354744709	47μF, 16V, Elect.
C155-C157	354721019	100 μF, 6.3V, Elect.
C159	354721019	100 μF, 6.3V, Elect.
C164	354780479	4.7 μF, 50V, Elect.
C165	354724719	470 μF, 6.3V, Elect.
C166	354782299	0.22μF, 50V, Elect.
C167	371121034	0.01μF 5%, 50V, Mylar
C173, C174	354721019	100 μF, 6.3V, Elect.
C177	371121044	0.1 μF 5%, 50V, Mylar
C178, C179	354744709	47μF, 16V, Elect.
C187-C190	354721019	100 μF, 6.3V, Elect.
C191, C192	372121014	100 pF 5%, 50V, Styrole
C193, C194	374723934	0.039 μF 5%, 50V, Plastic(TF)
C195, C196	374721524	1500pF 5%, 50V, Plastic(TF)
C197, C198	372122214	220 pF 5%, 50V, Styrole
C199, C200	374723924	3900pF 5%, 50V, Plastic(TF)
C201, C202	354782219	220 μF, 50V, Elect.
C203, C204	374722224	2200pF 5%, 50V, Plastic(TF)
C207, C208	373632224	2200pF 5%, 100V, Plastic(KP)
C209-C214	354782219	220 μF, 50V, Elect.
C911, C912	354753329	3300μF, 25V, Elect.
C913	354782219	220 μF, 50V, Elect.
C914	354764709	47μF, 35V, Elect.
C915, C916	354721029	1000μF, 6.3V, Elect.
C917	354764709	47μF, 35V, Elect.
C918	354780229	2.2 μF, 50V, Elect.
C919	354742229	2200μF, 16V, Elect.
C920	354751029	1000μF, 25V, Elect.
	Resistors	
R108	5210066	N06HR22KBD, Semi-fixed
R110	5210060	N06HR2.2KBD, Semi-fixed
R122, R132	5210066	N06HR22KBD, Semi-fixed
R154	5210058	N06HR1KBD, Semi-fixed
R179	49163472404	4.7k×4, 1/10W, Network
R207, R208	5210070 or 5210221	N06HR100KBD Semi-fixed
	Plugs	
P101	25055152	NPLG-8P136
P102	25055153	NPLG-9P137
P103	25055148	NPLG-4P132
P104	25055149	NPLG-5P133
P106, P108	25055038	NPLG-2P29
P107	25055045	NPLG-4P33
	Jack	
P105	25045172	HSJ1003-01-020
	Terminal	
P109	25045259	NPJ-2PDBL128, Output
	Socket	
J1	2009990067	NSAS-2P0103
	Radiator	
	27160176	RAD56
	Screw	
	82143006	3P+6FN(BC), Pan head
	Fuses	
QF101, QF102	252112	⚠ ICPN15, IC protector

DISPLAY CIRCUIT PC BOARD(NADIS-3836-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL tube	
Q701	212080	8-BT-94GK
	Switches	
S701-S713	25035548	NPS-111-S510
	Holder	
	27190754	FL tube

HEADPHONE AMPLIFIER PC BORAD (NAAF-3837-1A)

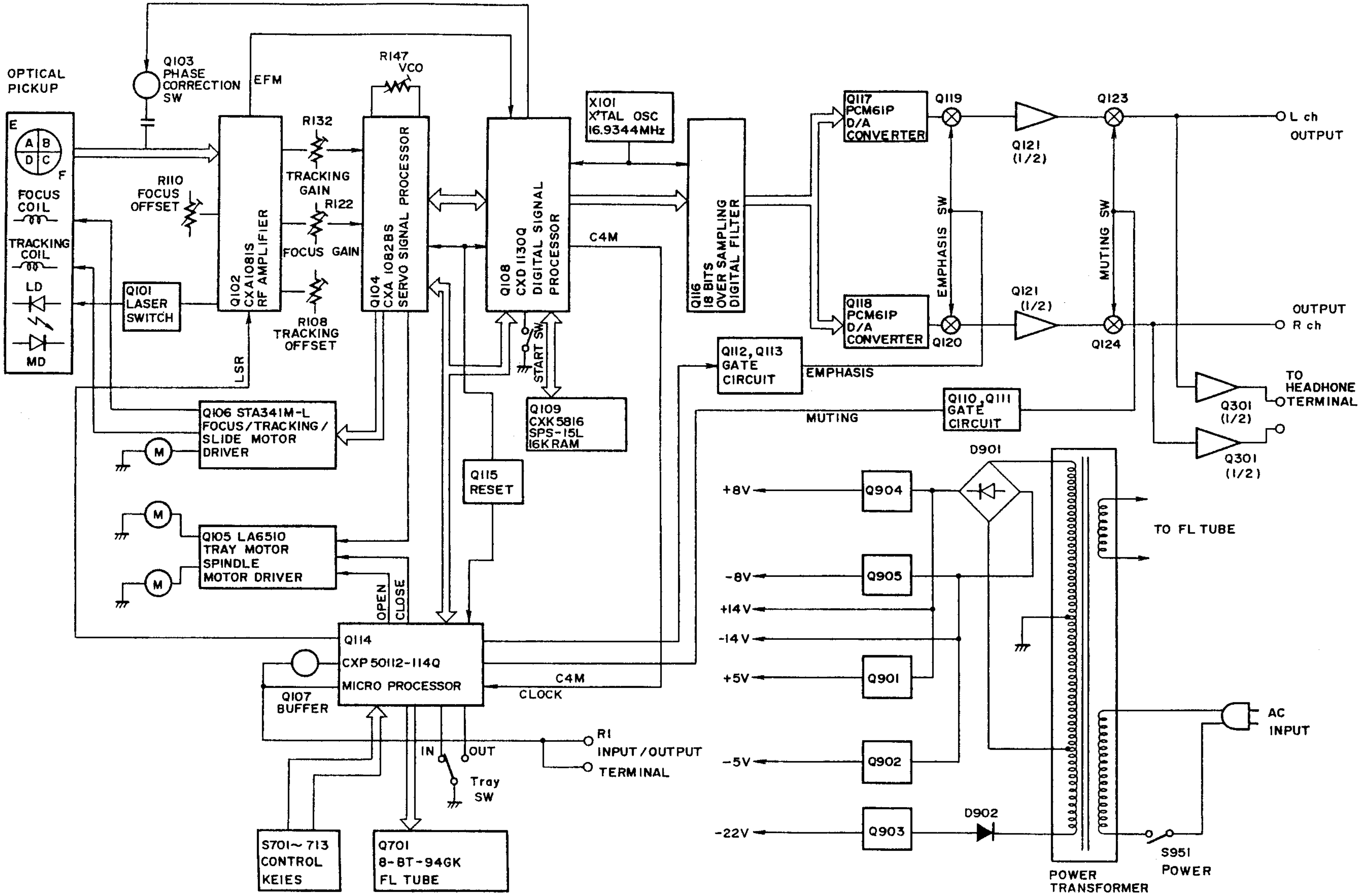
CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q301	222887	NJM4556S
	Capacitors	
C303, C304	354744709	47μF, 16V, Elect.
	Ferrite beads	
L301-L303	230905	BL02RN1-R62
	Jack	
P301	25045255	YKB21-5009

POWER SUPPLY PC BOARD(NAPS-3838-1)

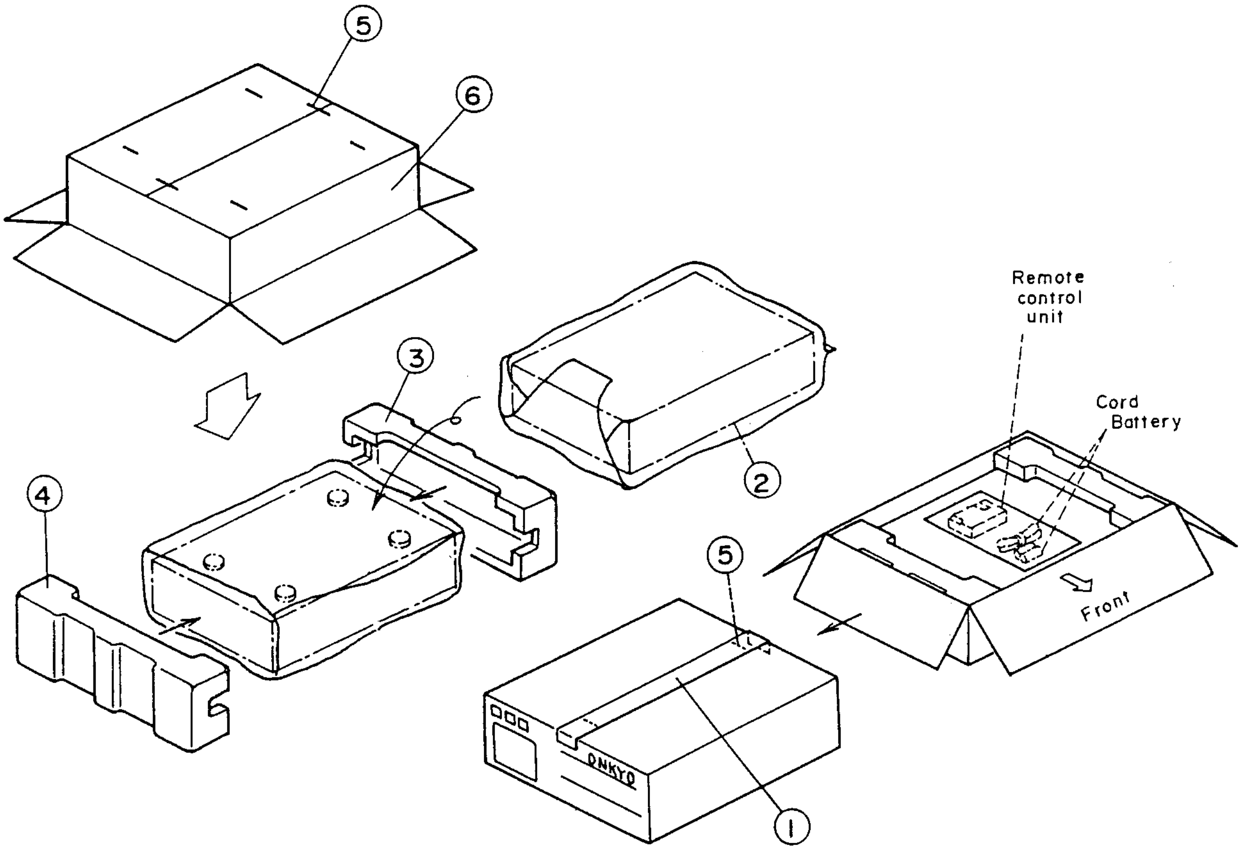
CIRCUIT NO.	PART NO.	DESCRIPTION
C951	3500065A	⚠ DE7150FZ103P AC400V/125V, Capacitor IS
S951	25035558	⚠ NPS-111-L520P, Power switch

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

BLOCK DIAGRAM


OPTICAL PICKUP
E
A B D C
F
FOCUS COIL
TRACKING COIL
LD
MD
Q103 PHASE CORRECTION SW
EFM
R110 FOCUS OFFSET
Q101 LASER SWITCH
LSR
Q102 CXA1081S RF AMPLIFIER
R132
TRACKING GAIN
R122
FOCUS GAIN
R108 TRACKING OFFSET
R147 VCO
Q104 CXA 1082BS SERVO SIGNAL PROCESSOR
Q108 CXD 1130Q DIGITAL SIGNAL PROCESSOR
START SW
Q109 CXK5816 SPS-15L 16K RAM
X101 XTAL OSC 16.9344MHz
C4M
Q116 18 BITS OVER SAMPLING DIGITAL FILTER
Q117 PCM61P D/A CONVERTER
Q118 PCM61P D/A CONVERTER
Q119
Q120
EMPHASIS SW
Q121 (1/2)
Q121 (1/2)
Q123
Q124
MUTING SW
L ch OUTPUT
OUTPUT R ch
Q301 (1/2)
Q301 (1/2)
TO HEADHONE TERMINAL
Q112, Q113 GATE CIRCUIT
EMPHASIS
Q110, Q111 GATE CIRCUIT
MUTING
Q106 STA341M-L FOCUS/TRACKING/ SLIDE MOTOR DRIVER
M
Q105 LA6510 TRAY MOTOR SPINDLE MOTOR DRIVER
M
M
Q115 RESET
OPEN
CLOSE
Q114 CXP 50112-114Q MICRO PROCESSOR
Q107 BUFFER
C4M
CLOCK
IN
OUT
Tray SW
R1 INPUT/OUTPUT TERMINAL
S701~713 CONTROL KEIES
Q701 8-BT-94GK FL TUBE
D901
+8V
Q904
-8V
Q905
+14V
-14V
+5V
Q901
-5V
Q902
-22V
Q903
D902
TO FL TUBE
POWER TRANSFORMER T901
AC INPUT
S951 POWER

PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29110071-1	50×600mm. Damplon tape
2	29100037	500×650mm, Poly-vinyl bag
3	29091394	Pad R
4	29091393	Pad L
5	282301	Sealing hook
6	29052041	Master carton box (Black model)
	29052042	Master carton box (Silver model)
	29095505	Protection sheet, Tray panel
	Accessary bag ass'y	
	2010098A	Connection cord
	29341498	Instruction manual
	29100097	350×250mm, Poly-vinyl bag
	2010200	Connection cord for remote control
	29365020A	Warranty card

ONKYO CORPORATION

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SN0M3358 A002 Printed in Japan